

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Appl. No. 09/0916,210 (Q61834)

REMARKS

Claims 9-11 are all the claims pending in the application.

I. Allowable claim 11

Applicants thank the Examiner for indicating that claim 11 contains allowable subject matter. Claim 11 has been amended into independent form, incorporating the features of claims 9 and 10. As such, Applicants submit that claim 11 is in a condition for allowance. Moreover, the amendment does not raise new issues that would require further consideration and/or search by the Examiner.

II. Rejection under 35 U.S.C. § 103(a)

The Examiner maintains the rejection of claims 9-10 under 35 U.S.C. 103(a) as being unpatentable over Pavlovic et al (U.S. Patent 6,591,146) in view of Aggarwal et al (IEEE, Human Motion Analysis) as previously discussed in the last Office Action of January 4, 2007.

The Examiner cites column 22, lines 13-49, of Pavlovic for teaching the claimed “determining a state, to which each frame belongs, using the obtained feature vectors”. (see claim 9). However, it does not appear that column 22, lines 13-49, of Pavlovic teaches or suggests this feature. Column 22, lines 13-49, appears to merely teach the derivation of what Pavlovic refers to as “the innovation”, Z_t . Z_t is a vector of pixel differences formed by subtracting pixels in a template model T from a region of pixels in an input video frame I_t under the action of the figure state (Col. 22, lines 25-28). Using equations 17 and 18, an image can be

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represented as vectors (Z_t), and $Z_t(k)$ represents the vector of pixel differences for the k th template pixel, whose intensity is given by $T(k)$ in equation 17 (Col. 22, lines 28-34). Moreover, in the case of model tracking, the $\text{pos}()$ function of equation 17 models the kinematics of the figure, which determine the relative motion of its parts for deriving the pixel difference as a function of the state vector x and the pixel index k (Col. 22, lines 13-49, and equation 17). Pavlovic, however, does not teach or suggest how a state, to which each frame belongs, is determined from the vector of pixel differences, Z_t .

Said differently, Z_t disclosed in Pavlovic merely seems to be a kind of immediate value to evaluate how modeling is well-performed. Referring to FIG. 12 and FIG. 15 of Pavlovic, vector Z_t represents the difference between the predicted state ($\hat{x}_t |_{t-1}$), which is predicted from the previous state ($\hat{x}_{t-1} |_{t-1}$), and the actual measurement y_t . Pavlovic merely teaches to control parameters with respect to Kalman filtering by determining the parameters minimizing Z_t . In other words, it appears that Z_t disclosed in Pavlovic represents the difference value between the predicted state and the actual state, and Pavlovic performs modeling by posterior update in order to minimize Z_t . However, the feature vector of the present invention is a kind of characteristic value representing the state of each frame, and is conceptionally different from Z_t of Pavlovic.

In view of the above, Pavlovic, at best, teaches that Z_t is passed to a posterior update module 502 along with the predicted state $X_t|t-1$, which are fused using a Kalman gain matrix to form a posterior estimate $X_t|t$ for the current frame (Col. 21, lines 40-42 and Figs. 12-13).

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Furthermore, the posterior estimate ($\hat{x}_t | t$) is merely an updated value from the predicted state ($\hat{x}_t | t-1$) by considering Z_t as described in Eq. 21 of Pavlovic. However, the determined state of the present invention is an actual state determined by using the obtained feature vectors.

Even if Pavlovic teaches determining a state, to which each frame belongs, using the obtained feature vectors, Pavlovic does not appear to teach determining an activity model using a transition matrix for the determined state, as the recognized activity, as asserted by the Examiner. The Examiner asserts that column 29, lines 1-31, of Pavlovic teaches this feature. Column 29, lines 1-31, of Pavlovic teaches a synthesis of state space trajectories in which the switching linear dynamic model (SLDS) is used as a generative mode within a synthesis model. That is, Pavlovic appears to merely teach that continuous state sequence X_t , such as a prototypical walk or a jog, can be synthesized by sampling from a SLDS model. In other words, Pavlovic merely teaches synthesizing an activity based on a learned model. Pavlovic, however, does not teach or suggest determining an activity model as a recognized activity from a given activity model dictionary using a transition matrix for the determined state, as recited in claim 9. Moreover, column 29, lines 1-31, of Pavlovic is silent on using any determined state, alleged by the Examiner, for determining an activity model as the recognized activity. Therefore, even if Agarwal does teach maximizing the probability between activity models and a video frame, a person of ordinary skill in the art would not have a reason to modify the teachings of Pavlovic with the teachings of Agarwal.

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Applicants submit that claim 9 is patentable for at least these reasons.

Also, Applicants submit that claim 10 is patentable at least by virtue of its dependency upon claim 9.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Peter A. McKenna
Registration No. 38,551

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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